

Claims

1. Thermostat valve arrangement for the cooling circuit of an internal combustion engine in which a main valve member of a main valve is movably mounted in a housing, which main valve member being able to be pressed against a main valve seat by a spring, in which a bypass valve member of a bypass valve is further provided which co-operates with a bypass valve seat in the housing and in which a first section of an expansion element (DWE) co-operates with an abutment fixed to the housing and a second section co-operates with the main valve member and the bypass valve member such that the main valve or bypass valve is selectively closed and/or opened, in order to produce the cooling circuit of the internal combustion engine by means of a radiator or a bypass, characterised in that the main valve seat (68) is formed from a conical seat surface in the housing (60, 64), the main valve member forms a valve unit with an axially spaced piston-shaped bypass valve member (14), which valve unit receives the expansion element in an axial recess in one direction in an axially secure manner, whilst the other end of the expansion element (28) is supported by an abutment (92) of the housing (60, 64), the valve unit is displaceably and axially guided in a guide component (36) which, in turn, is axially supported in the housing (60, 62), a valve spring (50) operating between the valve unit and the guide component (36), which valve spring biases the unit in the direction of the main valve seat (68) and the valve unit and the guide component (36) comprising co-operating stops by means of which the movement of the parts away from each other is limited and the piston-shaped bypass valve member (14) co-operates with a hollow cylindrical section (38) of the guide component (36).

2. Valve arrangement according to claim 1, characterised in that the main valve member comprises two coaxial plates (12, 18) which may be connected to one another and which receive a sealing ring (24) between one another which may be brought into engagement with the conical sealing surface (68) of the main valve seat.
3. Valve arrangement according to claim 2, characterised in that the plates (12, 18) may be connected to one another by means of snap-in pins (22) and snap-in holes (20) or the like.
4. Valve arrangement according to claim 2 or 3, characterised in that the expansion element (28) comprises a shaft which, on the end facing the main valve seat (68), has a radial flange (32) which is received in a complementary recess (30) of the plate (18) which faces said flange.
5. Valve arrangement according to any one of claims 1 to 4, characterised in that the main valve member is connected to the piston-shaped bypass valve member (14) via a plurality of axially parallel projections (16).
6. Valve arrangement according to claim 2 and 5, characterised in that the plate (12) facing the piston-shaped bypass valve member (14) is connected therewith via the projections (16) and forms therewith an integral component (10).

7. Valve arrangement according to any one of claims 1 to 6, characterised in that the guide component (36) comprises at least one axially parallel guide groove (44) which extends into the hollow cylindrical section (38) and which, on the end facing the piston-shaped bypass valve member (14), comprises a section (46) which is open to the side, and the piston-shaped bypass valve member (14) comprises a radial lug (48) which may be introduced therein via the lateral section (46) of the groove (44) in the style of a bayonet connection.
8. Valve arrangement according to claim 7, characterised in that the guide component (36) comprises a plurality of axially parallel arms (42) spaced apart from one another in the peripheral direction, in which one respective guide groove (44) is configured.
9. Valve arrangement according to any one of claims 1 to 8, characterised in that the guide component (36) comprises a radial flange (40) on which the valve spring (50) is supported.
10. Valve arrangement according to any one of claims 1 to 9, characterised in that the guide component (36) on the end facing a bearing surface for the guide component (36) in the housing, comprises a projection or an annular rib (76) which co-operates with an annular groove (77) in the support surface for the guide component (36).